

AMENDMENTS TO THE CLAIMS

1. (Previously amended) A packaged integrated circuit device comprising:

a substrate having a recessed central region surrounded by a raised perimeter, the recessed central region and the perimeter being formed integrally from substantially the same material, the recessed central region having a plurality of contacts within the recessed central region for providing electrical connection from conductors external to the substrate to an integrated circuit device; and

an integrated circuit device formed with contacts on a top surface, flipped, and placed against the recessed central region of the substrate such that the contacts of the integrated circuit device meet the contacts of the recessed central region of the substrate.

2. (Previously amended) The packaged integrated circuit device of Claim 1 wherein the contacts of the recessed central region of the substrate are electrically connected to solder balls on an external surface of the packaged integrated circuit device.

3. (Original) The packaged integrated circuit device of Claim 1 wherein the substrate is formed primarily from a ceramic material.

4. (Original) The packaged integrated circuit device of Claim 3 wherein the ceramic material also includes glass, thereby comprising a glass ceramic material.

5. (Previously amended) The packaged integrated circuit device of Claim 1 wherein the contacts of the recessed central region of the substrate comprise solder bumps.

6. (Original) The packaged integrated circuit device of Claim 1 further comprising a heat spreader connected to the integrated circuit device with thermal grease.

7. (Previously amended) The packaged integrated circuit device of Claim 6 wherein the heat spreader further contacts the raised perimeter.

8. (Original) The packaged integrated circuit device of Claim 6 wherein the integrated circuit device and the heat spreader are recessed such that an upper surface of the heat spreader is planar with an upper surface of the raised perimeter.

9. (Previously amended) The packaged integrated circuit device of Claim 1 wherein the raised perimeter includes electrical circuitry electrically connected to power and ground contacts of the integrated circuit device.

10. (Currently Amended) An integrated circuit package substrate comprising:

a recessed central region, defined by perimeter walls and a lower substrate floor, having a plurality of contacts for providing electrical contact to an integrated circuit device; and

a raised peripheral area, within the perimeter walls, including at least one by-pass capacitor connected to contacts within the recessed central region, wherein the raised peripheral area is formed integrally with the substrate floor.

11. (Original) The integrated circuit package substrate of Claim 10 wherein the capacitor has a sandwich construction comprising a plurality of ground plates connected to a ground terminal alternating with a plurality of power plates connected to a power terminal, and insulating material is disposed between adjacent plates.

12. (Original) The integrated circuit package substrate of Claim 11 wherein the ground and power terminals are connected respectively to ground and power supply terminals of the integrated circuit device.

13. (Previously added) A packaged integrated circuit device comprising:

a substrate having a recessed central region surrounded by a raised perimeter, the recessed central region and the perimeter comprising substantially the same material, the recessed central region having a plurality of contacts within the recessed central region for providing electrical connection from conductors external to the substrate to an integrated circuit device;

an integrated circuit device formed with contacts on a top surface, flipped, and placed against the recessed central region of the substrate such that the contacts of the integrated circuit device meet the contacts of the recessed central region of the substrate; and

a heat spreader connected to the integrated circuit device with thermal grease, wherein the integrated circuit device and the heat spreader are recessed such that an upper surface of the heat spreader is planar with an upper surface of the raised perimeter.

14. (Previously added) The packaged integrated circuit device of Claim 13 wherein the raised perimeter includes electrical circuitry electrically connected to power and ground contacts of the integrated circuit device.

15. (Previously added) The packaged integrated circuit device of Claim 9 wherein the electrical circuitry includes a by-pass capacitor.